DOCUMENT RESUME

ED 470 090 IR 021 528

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TITLE Build It and They Will Stay: A Research-Based Model for

Creating Community in Web-Based Learning Environments.

PUB DATE 2001-11-00

NOTE 10p.; In: Annual Proceedings of Selected Research and

Development [and] Practice Papers Presented at the National Convention of the Association for Educational Communications

and Technology (24th, Atlanta, GA, November 8-12, 2001).

Volumes 1-2; see IR 021 504.

PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)

EDRS PRICE EDRS Price MF01/PC01 Plus Postage.

DESCRIPTORS *Community Development; Computer Mediated Communication;

*Discussion (Teaching Technique); *Distance Education;

Educational Environment; *Educational Practices; Elementary Secondary Education; *Group Discussion; Higher Education; Online Systems; Teaching Methods; *Web Based Instruction;

World Wide Web

ABSTRACT

The use of electronic technologies for the delivery of instruction has grown at an exponential rate over the last five years. Institutions of higher education, corporations, and K-12 environments continue to seek ways to use online tools to deliver instruction. While the increased interest and need is an exciting development, several challenges associated with the successful implementation of Web-based instruction remain unresolved. The purpose of this study was to explore best practices for community building in Web-based learning environments. The study took place in two Web-based courses at two universities. An embedded case study design was used, and multiple sources of evidence (chat and bulletin board transcripts, interviews, and surveys) were gathered to inform the results. Overall, participation in both courses indicated some sense of community, albeit limited in scope (the learners' indicated a stronger connection with their team members than with the larger class group). While more research is needed, the study indicates that enabling and encouraging the use of these strategies and techniques may contribute to the long-term viability and use of Web-based instruction in institutions of higher education. (Contains 26 references.) (Author/AEF)



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Abstract

The purpose of this study was to explore best practices for community building in Web-based learning environments. The study took place in two Web-based courses at two universities. An embedded case study design was used, and multiple sources of evidence (e.g., chat and bulletin board transcripts, interviews, and surveys) were gathered to inform the results. Overall, participants in both courses indicated some sense of community, albeit limited in scope (i.e., the learners indicated a stronger connection with their team members than with the larger class group). While more research is needed, our study indicates that enabling and encouraging the use of these strategies and techniques may contribute to the long-term viability and use of WBI in institutions of higher education.

Introduction

The use of electronic technologies for the delivery of instruction has grown at an exponential rate over the last five years. Institutions of higher education, corporations and K-12 environments continue to seek ways to use on-line tools to deliver instruction. Concurrently, the technological infrastructure is expanding in terms of its capabilities and power (Daniel, 1998; Katz, 1999), increasing learner access to the technologies needed to acquire and share information with other participants. This convergence in interest by educators and learners in learning via distance technologies has enabled an exponential increase in the quantity of distance courses and programs across disciplines (e.g., art, history, information systems, education, science) and contexts (Otchet, 1998).

While the increased interest and need is an exciting development, several challenges associated with the successful implementation of Web-based instruction (WBI) remain unresolved, including retention and high dropout rates (see Barley, 1999; and Hill, in press, for an overview of several issues). Retention has historically presented challenges for distance educators. According to Moore & Kearsley (1996), dropout rates have ranged from 30 - 50%. While this figure is inclusive of a variety of distance learning technologies (video, print, etc.) and the authors point out that the dropout rate would now be at the lower end, 30% is still a considerable percentage to lose in a learning experience. WBI, with its high demands psychologically and technically, makes this challenge even more significant.

Several factors may contribute to retention challenges in distance education. Factors mentioned in the literature include: lack of prior experience with distance learning, external demands, and conflicts with motivation demands (external vs. internal) (see, for example, Carr, 2000). Another explanation for high dropout rates and dissatisfaction with distance delivered courses may relate to a lack of a perception of community in courses that are not face-to-face. Students may feel like they are isolated, creating an experience of lack of presence from others involved in the course.

Perception of a community may assist learners with feeling connected or belonging (Halaby, 2000; Joyce & Weil, 1996). Research in on-line environments indicates that community building can occur in distance delivered courses (Hill, 1999a; Palloff & Pratt, 1999), much like community building can occur in virtual teams in the business sector (Lave & Wenger, 1991; Raven, 1999). Given that a sense of a community has been demonstrated to contribute to group performance within a corporate context (Lave & Wenger, 1991), it may prove to be a benefit in a learning context. Discovering the best strategies and techniques for community building may lead to enhanced course outcomes (e.g., retention, satisfaction, learning outcomes) by participants in WBI.

Purpose

The purpose of this study was to explore best practices for community building in WBI. In doing so, the study sought to examine specific strategies and techniques designed to facilitate the establishment of an on-line community. The study was guided by the following general research question:

What are the best techniques/strategies to enable community building in WBI?

This question was addressed through a number of sub-questions, two of which will be focused upon in this paper:

• What can we do, as designers of, and instructors in, a WBLE to assist the learner in the effective building of community while learning in a Web-based environment?



 What strategies can learners use to assist themselves (individually and with each other) in community building while engaged in learning in Web-based environments?

Significance of the Study

While considerable research has been conducted in the general area of distance learning, research specific to Web-based environments for learning has only recently been published (see, for example, Dehoney & Reeves, 1999; Khan, 1997; Hill, 1997a; Hill, 1999a; Owston, 1997; Pritchard, 1998), and most is being presented at a theoretical rather than an empirical level. As the Web and Internet-based technologies (e.g., bulletin boards, email, CUSeeMe, streaming video, instant messaging) continue to grow in popularity and use in higher education, we felt that institutions would benefit greatly from investigation of best practices related to WBI, in our case, specifically examining best practices for community building.

Interest in building community is certainly not new, nor is it something isolated to study in the context of higher education. Lave and Wenger (1991) have spent considerable time examining the issues related to forming community in a business and industry setting. Joyce and Weil (1996) called for the creation of a communities of professional educators within a school setting. Halaby (2000) brings the notion of belonging into the classroom setting, emphasizing a need to help students belong. More recently, Palloff and Pratt (2001) extended their work on community building within higher education settings, focusing on providing hints and tips for the online teacher.

Certainly, this work is useful and adds to our literature base. However, much of the work completed to date is primarily theoretical, and while based in experience, is not primarily driven by empirical research. Further, the current work does not define specific models for how to enable community-building in a Web-based environment -- both from the teacher and student perspective. We need data-driven strategies and models, presenting techniques on both sides of the desk, so that others can test the robustness of the models in a variety of environments.

Research Plan

Research Design

An embedded case study design was used for this study, involving the use of multiple cases, or embedded units, within a larger context. The unit of study in the case was the individual faculty member or student involved in the WBI implementation. Multiple sources of evidence were used to triangulate the data, thus addressing possible concerns with internal validity (Yin, 1994). This approach has been used by one of the researchers in previous research (Hill & Hannafin, 1997; Hill, 1997b), and has proven successful when looking to describe rich contexts, and for model development (Hill, 1999b).

Selection and Description of the Participants

Two groups of participants were engaged in this study. One consisted of a an instructor and students involved in the Master's level course Information Technology Infrastructures in a college of business at a university in a large metropolitan area. The other consisted of an instructor and Master's level students involved in the course Instructional Design in a college of education at a university in a rural area. The population included university instructors, instructional design experts and working professionals returning to school from various sectors of business and industry (e.g., information technology management, technical support, Web development) and education (K-12 and higher education).

The courses were selected for two primary reasons:

- Involvement in the courses was voluntary. Although for many students the courses were required for completion of the
 degrees, they decided when and how to take the course. Most students enter with a high level of interest and
 motivation.
- Learners begin the course with a variety of backgrounds, as well as differences in their technology experience. This variety is essential for examining strategies and techniques across potential students.

Two groups comprised the sample of this study:

- university faculty as subject matter experts to help inform the design, development, and implementation of the courses;
 and
- students enrolled in the courses during summer term.

WBI Development

Measures and Instrumentation

A combination of positivistic and interpretivist techniques were used in gathering evidence for the study. Various instruments were used to facilitate data collection for the study: surveys, interviews, observations, and content analysis of discussion transcripts. Positivistic techniques were used to generate individual difference measures for each case. Interpretivist techniques were used to monitor the use of community-building strategies and techniques.

Settings and Procedures

Implementation of the courses took place over a 78 week period during the summer of 2000. Data were collected in a variety of environments. Pilot testing with learners in the spring and data gathering with learners in the summer took place in the



environment in which the WBI was used, including campus computer labs and the learners' homes/places of employment (depending on where they have access to the Web). A combination of questionnaires, observations, interviews, and content analysis of transcripts from on-line discussions were used to gather data from students. The facilities and necessary equipment for data gathering were fully established at each institution.

Analysis

To the extent possible, the collection, organization, and initial analysis of data occurred concurrently. Previous research indicates that this assists with indicating gaps in data as they are gathered and allow for adaptations in the process (e.g., need for additional information) (Glaser & Strauss, 1967; Hert, 1992; Hill & Hannafin, 1997). One "gap" that did occur related to the number of participants. We did experience a reduction in participants in both courses, with the final number of participants being 21 in the Information Technology Infrastructures course and 22 participants in the Instructional Design course.

In-depth data analysis took place throughout the academic year following the offering of the courses. One level of in-depth analysis involved reading through and coding the transcripts from the online chat and bulletin board discussions. As the researchers read the data, pre-established codes were used to mark-up the data (Ericsson & Simon, 1984; Hill & Hannafin, 1997). Additional codes were established as themes and patterns not readily applicable to the established categories emerged.

Another level of in-depth analysis involved chunking sections of the data related to specific research questions according to pre-established strategies and techniques for community building (Hill, 1999b). Pattern matching was used to inform the generation of an overall list of strategies and techniques -- instructor and student -- for community building in WBI, enabling the creation of a theoretical model for community-building in WBI. These coding and analysis techniques have been documented in the literature (Bogdan & Biklen, 1992; Krathwohl, 1998; Yin, 1994) and were used by the researchers in previous studies (Hill, 1997b; Hill & Hannafin, 1997).

Data Presentation

The content of each student's and instructor's posting was analyzed to determine the number and type of constructs was examined. Thirteen constructs in participants' posting were identified: active interaction, socially constructed meaning, expressions of support and encouragement, collaborative learning, sharing information, acknowledgement of others, chitchat, teacher initiative, student initiative, teacher response, student response, student evaluation, and teacher evaluation.

To help inform the results, the data were first divided into two main categories: infrastructure strategies and interaction strategies. Codes and definitions for strategies included in these categories are displayed in Table 1.

Codes	Constructs	Definition
AI	Active Interaction	Involving both course content and personal communication; purposeful, engaged, energetic
SCM	Socially Constructed Meaning	Agreement or questioning with the intent to achieve agreement on issues of meaning
ESE	Expressions of Support and Encouragement	Encouraging comments to their classmates. Exchanged between students.
CL	Collaborative Learning	Sharing ideas and knowledge among students. Comments directed primarily student to student rather than student to instructor
SI	Sharing Information/Resources	Among students (resources = container) Integration of people, resources
ACK	Acknowledgement of others	Noting presence of person
CC	Chit Chat	Social interactions not related to class

Table 1. Codes for infrastructure strategies

We also divided the interaction strategies categories (data) into two other categories: instructor strategies and student strategies. Codes and definitions for strategies included in these categories are displayed in Tables 2 and 3.

Codes	Constructs	Definition
TI	Teacher Initiative	Asking question to lead and facilitate the discussion
TR	Teacher Response	Answering questions to respond to student
TE	Teacher Evaluation	Teacher evaluation about student response

Table 2. Codes for interaction strategies – instructor strategies

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Codes	Constructs	Definition
TI	Teacher Initiative	Asking question to lead and facilitate the discussion
SI	Student Initiative	Asking question to negotiate or clarify the source and extent of
		disagreement
TR	Teacher Response	Answering questions to respond to student
SR	Student Response	Answering questions to respond to teacher
SE	Student Evaluation	Willingness to critically evaluate work of others
TE	Teacher Evaluation	Teacher evaluation about student response

Table 3. Codes for interaction strategies - student strategies

We also analyzed the data from a qualitative perspective, seeking to understand how events occurred overtime. Figures 1 and 2 exemplify the graphs we made to help inform this level of analysis.

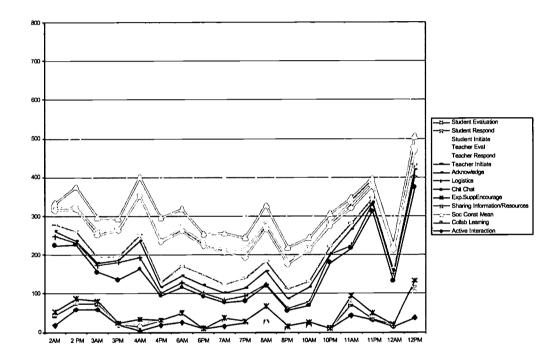


Figure 1. Coding of all chat sesions for the Information Infrastructures course

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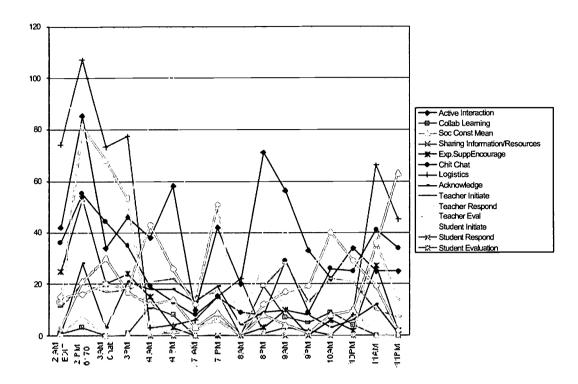


Figure 2. Coding of all chat sesions for the Instructional Design course

After coding of the transcripts was complete and initial patterns were emerging, the researchers then looked at other data sources as points of triangulation of the findings. Focus group interview notes were reviewed; end of term surveys were analyzed. Trends in these data were then compared to the trends and patterns established from the discussion transcripts. Strategies and techniques were adjusted as needed based on the data.

Findings and Results

Analysis of the data was an intensive task, cognitively and logistically. Many hours were spent by the researchers, individually and as a team, reviewing and refining our findings. The results of our efforts are presented below, organized according to our research questions.

What can we do, as designers of, and instructors in, a WBLE to assist the learner in the effective building of community while learning in a Web-based environment?

Based on feedback from the learners during implementation, as well as expert review of the course, there are several things that designers and instructors can do during the design, development and implementation stages to help with community building in WBI.

One strategy that proved very effective was ensuring that learners have sufficient opportunities to interact with each other as well as with the instructor. Our research indicates that learners want a variety of ways to interact with each other. Learners in the Information Infrastructures course and the Instructional Design course indicated that all of the communication technologies (e.g., chat, bulletin boards, email, phone) were working well and were important for facilitating interactions.

Another strategy used in the Instructional Design course that proved effective was the use of CSM messages. CSM messages indicated to learners what they Could be doing, what they Should be doing, and what they Must be doing. These messages were sent out by the instructor once or twice a week to remind learners of tasks for the week. During the mid-term evaluation, learners indicated that the CSM messages were important not only for keeping them on track, but also for letting them know that the instructor was there.

Yet another strategy that proved effective for community building was the use of teams for completing work. In the Information Infrastructures course, teams of 2-4 worked together; in the Instructional Design course, teams of 2 worked together (i.e., Design Buddies). In both instances, the learners indicated that the team members contributed very positively to their sense of belonging and a sense of connection with others in the course.



There were also several strategies built into the structure of the Web sites to assist with community building. These included: access to multiple communication technologies, posting of announcements and "what's new" updates, and personal Web pages for each learner that included a picture and biographical information. All of these approaches appear to have contributed to the ability of a community to form as the learners interacted within, and used, the WBI environment for learning.

What strategies can learners use to assist themselves (individually and with each other) in community building while engaged in learning in Web-based environments?

Analysis of surveys, as well as transcripts from various interactions in the courses, indicate that several strategies were used by learners to assist themselves with community building and learning in a WBI environment. A strategy used by several learners was a daily visit to the Web site to check for new messages on the bulletin boards. While many learners indicated that this was frustrating ("takes too much time"), others stated that the frequent visits helped them with establishing a sense of belonging to the course.

Two other closely related community building strategies used by learners are encouragement and support. Evidence of this was seen throughout bulletin board postings, chat room interactions and e-mail messages between team members/Design Buddies as well as between WBI participants in general.

Several learners indicated that the experience was somewhat overwhelming. This comment related mainly to the number of messages learners had to read on bulletin boards, in chat sessions and in e-mail. One strategy mentioned by several learners was that of scanning; that is, reading for content not for detail, in order to keep the information exchange manageable. What are the best techniques/strategies to enhance community building in WBI?

Overall, several strategies and techniques for community building in WBI emerged from the initial analysis. The strategies and techniques, compiled across those discussed in the research sub-questions, have been divided into two main areas: infrastructure and interactions (see Table 4).

Infrastructure Strategies	Interaction Strategies
Access to multiple communication technologies.	Read for content not for detail.
Posting of announcements and "what's new" updates.	Encourage and support fellow learners in their efforts.
Personal Web pages for each learner.	Use CSM messages to indicate to learners what they Could be doing, what they Should be doing, and what they Must be doing in terms of the course.
Learners have sufficient opportunities to interact with each other as well as with the instructor.	Use of teams for completing work in the course.
	A daily visit to the Web site to check for new messages on the bulletin boards.

Table 4. Strategies and techniques for community building in on-line environments.

Infrastructure strategies are the responsibility of the instructor. They create the environment that enables or inhibits the formation of community. Interaction strategies take place during the class, they involve actions from both the students and the instructor/facilitator.

We have also represented the strategies in terms of target audience, i.e., instructor or learner (see Table 5).

Instructor Strategies	Learner Strategies
Provide multiple opportunities for interaction.	Visit the course Web site daily (or every other day at a
	minimun).
Send out management related messages (e.g., CSMs) on a	Provide encouragement and support.
regular basis.	
Establish teams so that learners work together to complete	Scan material posted on the Web site - do not read for detail.
tasks	
Keep the Web site up-to-date and add in new information on a	
regular basis to keep things "fresh."	

Table 5. Instructor and Learner Strategies for community building in on-line environments.

Community Building: A Process-based Model

It would appear that some level of community building did occur in both the Information Infrastructures and the Instructional Design courses. Specifically, by looking at graphs of the interaction data (as recorded in the bulletin board and chat transcripts (see examples in Figures 1 and 2)), we see evidence that community was established over time and that there were certain points in the term where participants were "closer" in terms of a community than others.



The analysis completed to date has enabled the creation of the beginnings of a theoretical model for community building and its potential relationship to learning (see Figure 3). While the model is not complete, it does exemplify a significant step toward identification of strategies and techniques that can enable the creation of community in WBI.

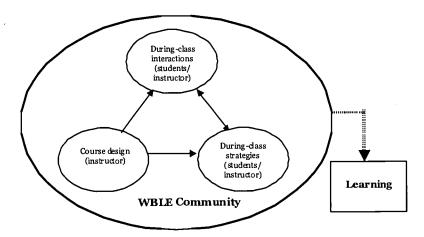


Figure 3. Creating Community for Learning

The model in Figure 3 illustrates how community building strategies may lead to community building activities that take place during a class, which leads to the existence of community. The existence of community is predicted to result to higher levels of learning. This learning can be measured through the coding of instances of socially constructed meaning, and collaborative learning.

As discussed earlier, in the design phase of a course, the instructor can implement a number of strategies that provide a basic infrastructure for community building. During the class, both instructor and students can use interaction strategies for community building. The two sets of strategies lead to interactions during the class, again by students and instructor, and these interactions lead to the emergence of a community.

Discussion & Suggested Next Steps

This study investigated strategies and techniques for community building in WBI. Overall, participants in both courses indicated some sense of community, albeit limited in scope (i.e., the learners indicated a stronger connection with their team members than with the larger class group). While more research is needed, our study indicates that enabling and encouraging the use of these strategies and techniques may contribute to the long-term viability and use of WBI in institutions of higher education.

As we continue work in this area, we are also beginning to consider different questions and issues to explore. One issue we offer as an area for additional study is that of adjustments to change. As compared to face to face classes, WBI courses place more demands on both instructor and students in terms of amount of time worked, and number of student-instructor and student-student interactions. As with regular face to face classes, it is better to wait with the evaluation of a WBI course until it has been taught at least twice. The first time around is typically a learning experience for the instructor and the learner; better to use this as a vehicle to determine what works and what doesn't, and then make additional judgments the second -- or third -- time around.

We also recognize the need for assisting others in the implementation of community building strategies in their own WBI experiences. Models and tools to assist with this effort would go a long way toward helping others interesting in building community in their own WBI. We are currently developing a model for community building in WBLEs, and encourage others to also explore this area.

Conclusion

By delivering engaging and meaningful instruction in WBI environments, the university can increase its visibility and viability in the 21st century educational arena. Further, results from this study can be used to guide and facilitate the design, development, and implementation of WBI to increase interaction and engagement. This, in turn, can potentially lead to higher retention (our experience: 94%) and satisfaction (our experience: high) in on-line courses at institutions of higher education.



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